REMARKS

Applicant, his principal representatives in Germany, and the undersigned have carefully reviewed the first Office Action on the merits of October 10, 2007 in the subject U.S. patent application, together with the prior art cited and relied on by the Examiner in the rejections of the claims. In response, the claims of the application have been cancelled and have been replaced with new claims. It is believed that the claims now pending in the application are patentable over the prior art cited and relied on, taken either singly or in combination. Reexamination and reconsideration of the application, and allowance of the claims is respectfully requested.

As disclosed in the Substitute Specification, as depicted in the formal patent drawings filed with the application, and as recited in currently presented claims 103-130, the subject invention is directed to a drive unit arrangement for use in a web-fed rotary printing press and to a method for using such a drive unit arrangement. In current printing presses there are typically provided a large number of press units that all operate together as the printing press. These press units can include printing towers that have plural individual press couples or units, separate printing units, individual cylinders and rollers, guide elements, formers, perforating arrangements, collecting devices, cutting devices, cross-folding devices and the like. Each such press unit is now typically driven by its own separate drive motor. In some machines, several components in one press unit may be driven by a common motor. However, it is becoming more typical to provide a separate drive motor for each of the numerous press units.

At one time, virtually all of the components in a printing press were driven by gear drive arrangements off a common main shaft. Such gear drive arrangements were typically very complex and required numerous adjustments to correct registration errors, to compensate for cylinder size variations and to generally keep the printing presses running properly. As will readily be appreciated, the use of such a physical main or master drive shaft, for use in driving all of the various press components was a very difficult and complex task.

It is much more satisfactory to provide each press component with its own separate motor and to use all of the separate drive motors to drive only their single associated press component. However, such a system still has to be coordinated so that all of the cylinders, rollers, formers, folders and other press components act in concert.

One way to accomplish this, and which has become the preferred method of press operation is to provide a so-called virtual shaft. As the name implies, such a virtual shaft is not a physical shaft but instead is a conceptual shaft by which angular positions of all of the associated press components can be set. These angular positions, as determined by the virtual shaft, are ideal or theoretical positions which would be appropriate in a press environment that was free of imperfection. However, since such imperfections exist, the ideal or theoretical angular positions of all of the press components have to be fine tuned or adjusted to arrive at actual working values which will result in the production of a high-quality product.

In high speed printing, and with a huge number of individually driven press units, the virtual shaft is comprised of signals that are sent to all of the components every few microseconds. As will be readily appreciated, the signal carrying ability of a signal line that has to carry such a large number of signals, can be exceeded. In accordance with the present invention, this is prevented by sending corrective signals through a second separate line. Also, in order not to disturb or to disrupt the higher-order signals from the virtual shaft, the several corrective signals are provided to lower-order control units which can then match the signals from the virtual shaft and the correction signals for each of the press components. The results of the matching in the lower-order control units of the virtual shaft angular position set points and the correctional values, which have been sent over the two separate first and second lines, can then be directed from the lower-order control units to the separate drive motors for the individual drive motors.

Referring initially to Fig. 2 of the drawings, the individual press units 01; 02; 03; 04; 06; 07 and the like are each drives by a separate drive motor M. These drive motors are controlled

by drive units with drive regulation, as depicted at 08. A first signal line 09 is used to send the master shaft angular position set points of a virtual master shaft to each of the separate drive motors. The virtual master shaft and the master shaft angular position set points can be provided by an operating unit 10 and a suitable computer 11. As may be seen in Fig. 2, there may be provided lower order drive control units 17 intermediate the virtual master shaft first line 09 and the drive units with drive regulation 08.

A second signal line 14 is provided and is also connected to the operating unit 10 and to the computer 11. This second line is used to transmit offset values defining a displacement of the angular position set point value for a particular one or ones of the individual drive motors. Essentially, these offset values are used to correct the master shaft angular position set points of the virtual shaft, which are somewhat theoretical values, to compensate for difference between theoretical and actual dimensions, speeds, plate sizes, and the like. The offset values can be input by the press operators as a result of visual observations of printed product quality. More typically, the printed product will be inspected and the press units will be adjusted automatically to correct whatever errors are noted. The Examiner is requested to review the Substitute Specification, and particularly paragraphs 030-035 thereof, wherein the structure and operation of the subject invention is described in some detail. The Examiner is also requested to review the discussion at paragraph 013 of the Substitute Specification where the benefits provided by the use of two separate signal lines, as discussed above, is set forth.

In the first Office Action on the merits of October 10, 2007 in the subject U.S. patent application, the Examiner acknowledged that the numbering of the claims, as set forth in the Preliminary Amendment, was accurate, and agreed to return the claims to their numbering, as set forth in that Preliminary Amendment. The applicant's election, with traverse, was also noted by the Examiner who did not find the applicant's arguments persuasive. Accordingly, the request was made final. Claims 81-93 and 97-102 were withdrawn from consideration by the Examiner.

Claims 52-80 and 94-96 were objected to as being unclear, generally narrative, with inferentially recited elements and with a lack of proper antecedent basis. In response, all of claims 52-102 have been cancelled. Objected to claims 52-80 and 94-96 have been rewritten as new claims 103-130. New claims 103-130 are believed to be in proper U.S. form and are believed to particularly point out and to distinctly claim the subject matter which applicant believes to be the invention. No additional claim fee is believed to be required since the total number of claims now pending in the application, and the number of independent claims are both less than the numbers paid for at the time of the filing of the application.

Applicant's cancellation of claims 81-93 and 97-102 is not to be construed as an abandonment of the inventions or groups of inventions recited in those claims. Applicant expressly reserves the right to file one or more divisional patent applications directed to these inventions.

Claims 52-80 and 94-96 were rejected under 35 USC 103(a) as being unpatentable over U.S. patent No. 4,394,835, asserted as being the Grützmacher et al. patent, in view of U.S. patent No. 5,901,647 to Kohlmann. It is noted that U.S. patent No. 4,394,835 was actually issued to Gretsch et al. and does not appear to be particularly relevant to the subject invention. It shows a drive for a rotary-roller offset printing machine but does not seem to be concerned with a virtual shaft or with the generating of offset values of the angular position set points presented by the virtual shaft. It is noted that U.S. patent No. 6,823,792 to Grützmacher et al. was cited by the Examiner in the PTO-892 form that accompanied the Office Action of October 10, 2007. It is believed that this '792 Grützmacher patent is the one actually being relied on by the Examiner in the rejection of the claims. The '792 Grützmacher patent appears to show a control unit 78 in Fig. 4, as asserted in the Office Action. It is noted that U.S. patent No. 5,481,971, also to Grützmacher et al., was cited by the undersigned in the Information Disclosure Statement which was filed with the application. It is believed that this is not the Grützmacher reference discussed in the rejections of the claims. In the interest of advancing the

prosecution of the application, the following discussion will assume that Grützmacher '792 is the reference being relied on by the Examiner, in combination with Kohlmann, 5,901,647, in the rejections of the claims.

Turning then to the Grützmacher '792 patent, it is noted that there are substantial differences between it and the subject invention, as recited in currently presented claims 103-130. Initially, in the Grützmacher '792 patent, there are provided a number of individual sheet printing units 4-15, as depicted in Fig. 1. However, these sheet printing units 4-15 are divided into three printing unit groups A, B and C, also depicted in Fig. 1. Printing group A, which includes individual sheet printing units 4-7 or 4-8, is driven by a single centrally located gear 35 which is driven by a main drive motor 29 for the group A printing unit group. This is quite different from the subject invention, as recited in newly presented claim 103 which recites a plurality of press units with a separate drive motor for said press unit and adapted to drive each such press unit independently. The press units of the subject invention, as defined in the Substitute Specification, are not groups of printing units, as set forth in the Grützmacher '792 reference.

In Grützmacher '792, as seen in Fig. 4, and as relied on by the Examiner, there is depicted a closed loop for the control of the sole motor 29 that drives the centrally located gear 35 for the first printing unit group A which, as indicated above, includes the separate sheet printing units 4-7 or 4-8. A control device 78 is used to control a power component 49 that drives the main motor 29. A rotary encoder 38 senses the actual portion of the central gear 35 which drives all of the printing units 4-7 or 4-8 in the printing unit group A. A desired or normal rotational angle for the control gear 35 is fed to the control device 78 from a desired or a normal value transmitter 79. The control device 78 includes a desired value/actual value comparator. If the nominal or desired value of the angular position of the central gear 35 is different from the actual position of that gear 35, as sensed by the rotary encoder 38, the control device 78 will send an appropriate signal to the power component 49.

The Examiner's characterization of the Grützmacher '792 reference is not correct. As noted above, this reference shows groups of printing units with each group having a single drive motor. A control unit 78, as discussed above, is used to control the amount of power sent to the main motor 29 which drives the single central gear 35 that is driven by the control drive motor 29. Obviously, the control device 29 is connected to the power component 49. That is the extent to which the Grützmacher reference is relied on in the rejection of the claims of the subject application.

Claim 103 recites a drive unit arrangement in which a master shaft angular position set point of a virtual shaft is generated for each of the separate drive motors. Grützmacher '792 does not discuss, depict or suggest the provision of a virtual master shaft and does not discuss, depict or suggest the generation of a master shaft angular position set point for each of the separate drive motors. At best, Grützmacher shows separate control loops for each group of printing units. Each such loop compares an actual position of its respective main gear and a nominal or desired position for that main gear. A change in the actual position, to bring it into alignment with the desired or nominal position, is effected by varying the amount of power supplied to a main motor, such as motor 29 by a power component 49. There is no discussion of a first signal line in Grützmacher to carry the master shaft angular position set point to each of the drive units. Grützmacher is equally silent as to the provision of any means for generating an offset value defining a displacement of the angular position set point, also as recited in newly presented claim 103. Further, there is no recitation or suggestion in Grützmacher of a second signal line that is adapted to carry the offset value to the drive unit for drive regulation of each of the particular ones of the separate drive motors.

The secondary reference to Kohlmann does not supply the teachings of the device of newly presented claim 103 which are missing from the Grützmacher reference. In Kohlmann there are shown several formers 1 and 44 which are usable to longitudinally form and fold first and second webs 2 and 46, respectively. These webs are then fed through several sets of

perforating rollers 3;4 and 6;7 and are then further processed by being cross-cut and folded. A number of individual drive motors are provided for each one of the various rotating cylinders shown in Fig. 1 of Kohlmann. In that limited respect, Kohlmann appears to be more similar to the present invention than does the Grützmacher reference which shows a single main drive motor for a group of press components.

In the discussion of the Kohlmann device, as set forth at Column 3, starting at line 38 an instantaneous tolerance range of the rotary angular position is preset for each of the separate drive motors. An instantaneous actual value of the rotary positions of selected drives are compared in a computer 61 with the preset values. If the difference between the preset values and the actual values exceeds a tolerance range, a safety device is activated. The activation of that safety device will prevent the continued flow of material to the units.

In the Office Action, it is asserted that the Kohlmann reference shows the provision of drive motors and control units that are connected by a signal line 59. While that is essentially correct, there is no teaching, suggestion or disclosure in Kohlmann of the generation of a master shaft angular position set point of a virtual shaft for each of the plurality of press units. There is no teaching, suggestion or disclosure in Kohlmann of at least one first signal line to carry that master shaft angular position set point to each of the drive units. Similarly, in Kohlmann there is no means for generating an offset value determining a displacement of the angular position set point of a particular one of the motors with respect to the master shaft angular position set point. Finally, Kohlmann does not teach, suggest or disclose a separate second signal line that is adapted to carry the offset value to the particular drive unit, all as recited in newly presented claim 103.

Newly presented independent method claims 128 and 130 are generally similar to the apparatus recited in newly presented apparatus claim 103. The methods recited in these two claims are also not taught or suggested by the disclosures of Grützmacher and Kohlmann, taken either singly or in combination.

The various dependent apparatus claims and the sole dependent method claim all depend from their respective, believed allowable new apparatus and method claims. Accordingly, they are also believed to be allowable.

The several additional references cited by the Examiner in the Office Action of October 10, 2007, but not relied on in the rejections of the claims, have been noted. Since they were not applied against the claims, no discussion thereof is believed to be required.

SUMMARY

Previously pending claims 52-102 have all been cancelled. New claims 103-130 have been added. It is believed that these claims are patentable over the prior art cited and relied on, taken either singly or in combination. Allowance of the claims, and passage of the application to issue is respectfully requested.

Respectfully submitted,

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